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SEQUENCE LISTING

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<120> Therapeutic Methods Comprising Use of a  
Neuregulin

<130> 04585/048002

<140> US 09/530,884

<141> 2000-08-29

<150> PCT/US98/21349

<151> 1998-10-08

<150> US 60/062,109

<151> 1997-10-14

<160> 54

<170> FastSEQ for Windows Version 4.0

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<220>

<221> CDS

<222> (1)...(744)

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gcc cag cgc ccc ggc tcc gcc gcc cgc tcg tcg ccg ccg ctg ccg ctg 96  
Ala Gln Arg Pro Gly Ser Ala Ala Arg Ser Ser Pro Pro Leu Pro Leu  
20 25 30

ctg cca cta ctg ctg ctg ctg ggg acc gcg gcc ctg gcg ccg ggg gcg 144  
Leu Pro Leu Leu Leu Leu Gly Thr Ala Ala Leu Ala Pro Gly Ala  
35 40 45

gcg gcc ggc aac gag gcg gct ccc gcg ggg gcc tcg gtg tgc tac tcg 192  
Ala Ala Gly Asn Glu Ala Ala Pro Ala Gly Ala Ser Val Cys Tyr Ser  
50 55 60

tcc ccg ccc agc gtg gga tcg gtg cag gag cta gct cag cgc gcc gcg 240  
Ser Pro Pro Ser Val Gly Ser Val Gln Glu Leu Ala Gln Arg Ala Ala  
65 70 75 80

gtg gtg atc gag gga aag gtg cac ccg cag cgg cgg cag cag ggg gca 288  
Val Val Ile Glu Gly Lys Val His Pro Gln Arg Arg Gln Gln Gly Ala  
85 90 95

ctc gac agg aag gcg gcg gcg gcg gcg gag gca ggg gcg tgg ggc 336  
 Leu Asp Arg Lys Ala Ala Ala Ala Gly Glu Ala Gly Ala Trp Gly  
                   100                  105                  110

ggc gat cgc gag ccg cca gcc gcg ggc cca cgg gcg ctg ggg ccg ccc 384  
 Gly Asp Arg Glu Pro Pro Ala Ala Gly Pro Arg Ala Leu Gly Pro Pro  
                   115                  120                  125

gcc gag gag ccg ctg ctc gcc gcc aac ggg acc gtg ccc tct tgg ccc 432  
 Ala Glu Glu Pro Leu Leu Ala Ala Asn Gly Thr Val Pro Ser Trp Pro  
                   130                  135                  140

acc gcc ccg gtg ccc agc gcc ggc gag ccc ggg gag gag gcg ccc tat 480  
 Thr Ala Pro Val Pro Ser Ala Gly Glu Pro Gly Glu Glu Ala Pro Tyr  
                   145                  150                  155                  160

ctg gtg aag gtg cac cag gtg tgg gcg gtg aaa gcc ggg ggc ttg aag 528  
 Leu Val Lys Val His Gln Val Trp Ala Val Lys Ala Gly Gly Leu Lys  
                   165                  170                  175

aag gac tcg ctg ctc acc gtg cgc ctg ggg acc tgg ggc cac ccc gcc 576  
 Lys Asp Ser Leu Leu Thr Val Arg Leu Gly Thr Trp Gly His Pro Ala  
                   180                  185                  190

ttc ccc tcc tgc ggg agg ctc aag gag gac agc agg tac atc ttc ttc 624  
 Phe Pro Ser Cys Gly Arg Leu Lys Glu Asp Ser Arg Tyr Ile Phe Phe  
                   195                  200                  205

atg gag ccc gac gcc aac agc acc agc cgc gcg ccg gcc gcc ttc cga 672  
 Met Glu Pro Asp Ala Asn Ser Thr Ser Arg Ala Pro Ala Ala Phe Arg  
                   210                  215                  220

gcc tct ttc ccc cct ctg gag acg ggc cgg aac ctc aag aag gag gtc 720  
 Ala Ser Phe Pro Pro Leu Glu Thr Gly Arg Asn Leu Lys Lys Glu Val  
                   225                  230                  235                  240

agc cgg gtg ctg tgc aag cgg tgc g 745  
 Ser Arg Val Leu Cys Lys Arg Cys  
                   245

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 <212> PRT  
 <213> Homo sapiens

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 Ala Gln Arg Pro Gly Ser Ala Ala Arg Ser Ser Pro Pro Leu Pro Leu  
                   20                  25                  30  
 Leu Pro Leu Leu Leu Leu Leu Gly Thr Ala Ala Leu Ala Pro Gly Ala  
                   35                  40                  45  
 Ala Ala Gly Asn Glu Ala Ala Pro Ala Gly Ala Ser Val Cys Tyr Ser  
                   50                  55                  60  
 Ser Pro Pro Ser Val Gly Ser Val Gln Glu Leu Ala Gln Arg Ala Ala  
                   65                  70                  75                  80  
 Val Val Ile Glu Gly Lys Val His Pro Gln Arg Arg Gln Gln Gly Ala

				85					90				95				
Leu	Asp	Arg	Lys	Ala	Ala	Ala	Ala	Ala	Gly	Glu	Ala	Gly	Ala	Trp	Gly		
			100						105				110				
Gly	Asp	Arg	Glu	Pro	Pro	Ala	Ala	Gly	Pro	Arg	Ala	Leu	Gly	Pro	Pro		
		115					120					125					
Ala	Glu	Glu	Pro	Leu	Leu	Ala	Ala	Asn	Gly	Thr	Val	Pro	Ser	Trp	Pro		
	130					135					140						
Thr	Ala	Pro	Val	Pro	Ser	Ala	Gly	Glu	Pro	Gly	Glu	Glu	Ala	Pro	Tyr		
145					150					155					160		
Leu	Val	Lys	Val	His	Gln	Val	Trp	Ala	Val	Lys	Ala	Gly	Gly	Leu	Lys		
			165					170						175			
Lys	Asp	Ser	Leu	Thr	Val	Arg	Leu	Gly	Thr	Trp	Gly	His	Pro	Ala			
		180					185					190					
Phe	Pro	Ser	Cys	Gly	Arg	Leu	Lys	Glu	Asp	Ser	Arg	Tyr	Ile	Phe	Phe		
	195					200					205						
Met	Glu	Pro	Asp	Ala	Asn	Ser	Thr	Ser	Arg	Ala	Pro	Ala	Ala	Phe	Arg		
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Ala	Ser	Phe	Pro	Pro	Leu	Glu	Thr	Gly	Arg	Asn	Leu	Lys	Lys	Glu	Val		
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Ser	Arg	Val	Leu	Cys	Lys	Arg	Cys										
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 <213> Bos taurus

<220>  
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ctg ctc acc gtg cgc ctg ggc gcc tgg ggc cac ccc gcc ttc ccc tcc	95
Leu Leu Thr Val Arg Leu Gly Ala Trp Gly His Pro Ala Phe Pro Ser	
20 25 30	
tgc ggg cgc ctc aag gag gac agc agg tac atc ttc ttc atg gag ccc	143
Cys Gly Arg Leu Lys Glu Asp Ser Arg Tyr Ile Phe Phe Met Glu Pro	
35 40 45	
gag gcc aac agc agc ggc ggg ccc ggc cgc ctt ccg agc ctc ctt ccc	191
Glu Ala Asn Ser Ser Gly Gly Pro Gly Arg Leu Pro Ser Leu Leu Pro	
50 55 60	
ccc tct cga gac ggg ccg gaa cct caa gaa gga ggt cag ccg ggt gct	239
Pro Ser Arg Asp Gly Pro Glu Pro Gln Glu Gly Gly Gln Pro Gly Ala	
65 70 75	
gtg caa cgg tgc g	252
Val Gln Arg Cys	
80	

<210> 4

<211> 83  
 <212> PRT  
 <213> Bos taurus

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 1 5 10 15  
 Leu Thr Val Arg Leu Gly Ala Trp Gly His Pro Ala Phe Pro Ser Cys  
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 Gly Arg Leu Lys Glu Asp Ser Arg Tyr Ile Phe Phe Met Glu Pro Glu  
 35 40 45  
 Ala Asn Ser Ser Gly Gly Pro Gly Arg Leu Pro Ser Leu Leu Pro Pro  
 50 55 60  
 Ser Arg Asp Gly Pro Glu Pro Gln Glu Gly Gly Gln Pro Gly Ala Val  
 65 70 75 80  
 Gln Arg Cys

<210> 5  
 <211> 59  
 <212> PRT  
 <213> Bos taurus

<400> 5  
 Leu Pro Pro Arg Leu Lys Glu Met Lys Ser Gln Glu Ser Val Ala Gly  
 1 5 10 15  
 Ser Lys Leu Val Leu Arg Cys Glu Thr Ser Ser Glu Tyr Ser Ser Leu  
 20 25 30  
 Lys Phe Lys Trp Phe Lys Asn Gly Ser Glu Leu Ser Arg Lys Asn Lys  
 35 40 45  
 Pro Gln Asn Ile Lys Ile Gln Lys Arg Pro Gly  
 50 55 6

<210> 6  
 <211> 178  
 <212> DNA  
 <213> Bos taurus

<220>  
 <221> CDS  
 <222> (3)...(176)

<400> 6  
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 Leu Pro Pro Arg Leu Lys Glu Met Lys Ser Gln Glu Ser Val Ala  
 1 5 10 15  
 ggt tcc aaa cta gtg ctt cgg tgc gag acc agt tct gaa tac tcc tct 95  
 Gly Ser Lys Leu Val Leu Arg Cys Glu Thr Ser Ser Glu Tyr Ser Ser  
 20 25 30  
 ctc aag ttc aag tgg ttc aag aat ggg agt gaa tta agc cga aag aac 143  
 Leu Lys Phe Lys Trp Phe Lys Asn Gly Ser Glu Leu Ser Arg Lys Asn  
 35 40 45  
 aaa cca caa aac atc aag ata cag aaa agg ccg gg 178  
 Lys Pro Gln Asn Ile Lys Ile Gln Lys Arg Pro

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55

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 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (1)...(177)

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 Pro Cys Leu Pro Asp \* Lys Arg \* Lys Ala Arg Asn Arg Leu Gln  
 1 5 10  
 gtt cca aac tag tcc ttc ggt gtg aaa cca gtt ctg aat act cct ctc 96  
 Val Pro Asn \* Ser Phe Gly Val Lys Pro Val Leu Asn Thr Pro Leu  
 15 20 25  
 tca gat tca agt ggt tca aga atg gga atg aat tga atc gaa aaa aca 144  
 Ser Asp Ser Ser Gly Ser Arg Met Gly Met Asn \* Ile Glu Lys Thr  
 30 35 40  
 aac cac aaa ata tca aga tac aaa aaa agc cag g 178  
 Asn His Lys Ile Ser Arg Tyr Lys Lys Ser Gln  
 45 50 55

<210> 8  
 <211> 59  
 <212> PRT  
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<400> 8  
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 1 5 10 15  
 Ser Lys Leu Val Leu Arg Cys Glu Thr Ser Ser Glu Tyr Ser Ser Leu  
 20 25 30  
 Arg Phe Lys Trp Phe Lys Asn Gly Asn Glu Leu Asn Arg Lys Asn Lys  
 35 40 45  
 Pro Gln Asn Ile Lys Ile Gln Lys Lys Pro Gly  
 50 55 6

<210> 9  
 <211> 41  
 <212> PRT  
 <213> Bos taurus

<400> 9  
 Lys Ser Glu Leu Arg Ile Ser Lys Ala Ser Leu Ala Asp Ser Gly Glu  
 1 5 10 15  
 Tyr Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala  
 20 25 30  
 Asn Ile Thr Ile Val Glu Ser Asn Ala  
 35 40

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 <211> 122  
 <212> DNA  
 <213> Bos taurus

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 <221> CDS  
 <222> (2)...(122)

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 g aag tca gaa ctt cgc att agc aaa gcg tca ctg gct gat tct gga gaa 49  
 Lys Ser Glu Leu Arg Ile Ser Lys Ala Ser Leu Ala Asp Ser Gly Glu  
 1 5 10 15  
 tat atg tgc aaa gtg atc agc aaa cta gga aat gac agt gcc tct gcc 97  
 Tyr Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala  
 20 25 30  
 aac atc acc att gtg gag tca aac g 122  
 Asn Ile Thr Ile Val Glu Ser Asn  
 35 40

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 <211> 122  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (2)...(122)

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 Lys Ser Glu Leu Arg Ile Asn Lys Ala Ser Leu Ala Asp Ser Gly Glu  
 1 5 10 15  
 tat atg tgc aaa gtg atc agc aaa tta gga aat gac agt gcc tct gcc 97  
 Tyr Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala  
 20 25 30  
 aat atc acc atc gtg gaa tca aac g 122  
 Asn Ile Thr Ile Val Glu Ser Asn  
 35 40

<210> 12  
 <211> 41  
 <212> PRT  
 <213> Homo sapiens

<400> 12  
 Lys Ser Glu Leu Arg Asn Ser Lys Ala Ser Leu Ala Asp Ser Gly Glu  
 1 5 10 15  
 Tyr Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala  
 20 25 30  
 Asn Ile Thr Ile Val Glu Ser Asn Ala  
 35 40



20 25 30  
 Ser Ser Ser  
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 <211> 102  
 <212> DNA  
 <213> Bos taurus

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 <221> CDS  
 <222> (3)...(101)

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 ile Thr Thr Gly Met Pro Ala Ser Thr Glu Thr Ala Tyr Val Ser  
 1 5 10 15  
 tca gag tct ccc att aga ata tca gta tca aca gaa gga aca aat act 95  
 Ser Glu Ser Pro Ile Arg Ile Ser Val Ser Thr Glu Gly Thr Asn Thr  
 20 25 30  
 tct tca t 102  
 Ser Ser

<210> 17  
 <211> 102  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (3)...(101)

<400> 17  
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 ile ile Thr Gly Met Pro Ala Ser Thr Glu Gly Ala Tyr Val Ser  
 1 5 10 15  
 tca gag tct ccc att aga ata tca gta tcc aca gaa gga gca aat act 95  
 Ser Glu Ser Pro ile Arg ile Ser Val Ser Thr Glu Gly Ala Asn Thr  
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 tct tca t 102  
 Ser Ser

<210> 18  
 <211> 35  
 <212> PRT  
 <213> Homo sapiens

<400> 18  
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 1 5 10 15



Ser Glu Ser Pro Ile Arg Ile Ser Val Ser Thr Glu Gly Ala Asn Thr  
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 Ser Ser Ser  
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<210> 19  
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 <212> PRT  
 <213> Bos taurus

<400> 19  
 Thr Ser Thr Ser Thr Ala Gly Thr Ser His Leu Val Lys Cys Ala Glu  
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 Lys Glu Lys Thr Phe Cys Val Asn Gly Gly Glu Cys Phe Met Val Lys  
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 Asp Leu Ser Asn Pro Ser Arg Tyr Leu Cys  
 35 40

<210> 20  
 <211> 128  
 <212> DNA  
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 <221> CDS  
 <222> (3)...(128)

<400> 20  
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 Thr Ser Thr Ser Thr Ala Gly Thr Ser His Leu Val Lys Cys Ala  
 1 5 10 15  
 gag aag gag aaa act ttc tgt gtg aat gga ggc gag tgc ttc atg gtg 95  
 Glu Lys Glu Lys Thr Phe Cys Val Asn Gly Gly Glu Cys Phe Met Val  
 20 25 30  
 aaa gac ctt tca aat ccc tca aga tac ttg tgc 128  
 Lys Asp Leu Ser Asn Pro Ser Arg Tyr Leu Cys  
 35 40

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 <212> DNA  
 <213> Homo sapiens

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 <221> CDS  
 <222> (3)...(128)

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 Thr Ser Thr Ser Thr Thr Gly Thr Ser His Leu Val Lys Cys Ala  
 1 5 10 15  
 gag aag gag aaa act ttc tgt gtg aat gga ggc gag tgc ttc atg gtg 95  
 Glu Lys Glu Lys Thr Phe Cys Val Asn Gly Gly Glu Cys Phe Met Val

20 25 30 128

aaa gac ctt tca aac ccc tcg aga tac ttg tgc  
 Lys Asp Leu Ser Asn Pro Ser Arg Tyr Leu Cys  
           35                  40

<210> 22  
 <211> 42  
 <212> PRT  
 <213> Homo sapiens

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           20                  25                  30  
 Asp Leu Ser Asn Pro Ser Arg Tyr Leu Cys  
           35                  40

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 <213> Bos taurus

<400> 23  
 Lys Cys Gln Pro Gly Phe Thr Gly Ala Arg Cys Thr Glu Asn Val Pro  
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 <212> DNA  
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atg aaa gtc caa acc caa gaa 69  
 Met Lys Val Gln Thr Gln Glu  
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 <211> 69  
 <212> DNA  
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<220>  
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<222> (1)...(69)

<400> 25

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Lys Cys Gln Pro Gly Phe Thr Gly Ala Arg Cys Thr Glu Asn Val Pro  
1 5 10 15

atg aaa gtc caa aac caa gaa 69  
Met Lys Val Gln Asn Gln Glu  
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<210> 26

<211> 23

<212> PRT

<213> Homo sapiens

<400> 26

Lys Cys Gln Pro Gly Phe Thr Gly Ala Arg Cys Thr Glu Asn Val Pro  
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Met Lys Val Gln Asn Gln Glu  
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<210> 27

<211> 20

<212> PRT

<213> Bos taurus

<400> 27

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<210> 28

<211> 60

<212> DNA

<213> Bos taurus

<220>

<221> CDS

<222> (1)...(60)

<400> 28

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gcc agc ttc tac 60  
Ala Ser Phe Tyr  
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<211> 60

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<213> Homo sapiens

<220>  
<221> CDS  
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gcc agc ttc tac 60  
Ala Ser Phe Tyr  
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<210> 31  
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<212> DNA  
<213> Bos taurus

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<222> (1)...(33)

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<212> DNA  
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<220>  
<221> CDS  
<222> (1)...(33)

<400> 32  
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1 5 10

<210> 33  
<211> 9  
<212> PRT  
<213> Bos taurus

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 Lys His Leu Gly Ile Glu Phe Met Glu  
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<210> 34  
 <211> 27  
 <212> DNA  
 <213> Bos taurus

<220>  
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 <222> (1)...(27)

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27

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 Cys Ile Ala Leu Leu Val Val Gly Ile Met Cys Val Val Val Tyr Cys  
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 Lys Thr Lys Lys Gln Arg Lys Lys Leu His Asp Arg Leu Arg Gln Ser  
 35 40 45  
 Leu Arg Ser Glu Arg Asn Thr Met Met Asn Val Ala Asn Gly Pro His  
 50 55 60  
 His Pro Asn Pro Pro Pro Glu Asn Val Gln Leu Val Asn Gln Tyr Val  
 65 70 75 80  
 Ser Lys Asn Val Ile Ser Ser Glu His Ile Val Glu Arg Glu Ala Glu  
 85 90 95  
 Ser Ser Phe Ser Thr Ser His Tyr Thr Ser Thr Ala His His Ser Thr  
 100 105 110  
 Thr Val Thr Gln Thr Pro Ser His Ser Trp Ser Asn Gly His Thr Glu  
 115 120 125  
 Ser Ile Ile Ser Glu Ser His Ser Val Ile Val Met Ser Ser Val Glu  
 130 135 140  
 Asn Ser Arg His Ser Ser Pro Thr Gly Gly Pro Arg Gly Arg Leu Asn  
 145 150 155 160  
 Gly Leu Gly Gly Pro Arg Glu Cys Asn Ser Phe Leu Arg His Ala Arg  
 165 170 175  
 Glu Thr Pro Asp Ser Tyr Arg Asp Ser Pro His Ser Glu Arg  
 180 185 190

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 <212> DNA  
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<220>  
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<222> (1)...(569)

<400> 36

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1 5 10 15	
tgc atc gcg ctg ctc gtg gtt ggc atc atg tgt gtg gtg gtc tac tgc	96
Cys Ile Ala Leu Leu Val Val Gly Ile Met Cys Val Val Val Tyr Cys	
20 25 30	
aaa acc aag aaa caa cgg aaa aag ctt cat gac cgg ctt cgg cag agc	144
Lys Thr Lys Lys Gln Arg Lys Lys Leu His Asp Arg Leu Arg Gln Ser	
35 40 45	
ctt cgg tct gaa aga aac acc atg atg aac gta gcc aac ggg ccc cac	192
Leu Arg Ser Glu Arg Asn Thr Met Met Asn Val Ala Asn Gly Pro His	
50 55 60	
cac ccc aat ccg ccc ccc gag aac gtg cag ctg gtg aat caa tac gta	240
His Pro Asn Pro Pro Pro Glu Asn Val Gln Leu Val Asn Gln Tyr Val	
65 70 75 80	
tct aaa aat gtc atc tct agc gag cat att gtt gag aga gag gcg gag	288
Ser Lys Asn Val Ile Ser Ser Glu His Ile Val Glu Arg Glu Ala Glu	
85 90 95	
agc tct ttt tcc acc agt cac tac act tcg aca gct cat cat tcc act	336
Ser Ser Phe Ser Thr Ser His Tyr Thr Ser Thr Ala His His Ser Thr	
100 105 110	
act gtc act cag act ccc agt cac agc tgg agc aat gga cac act gaa	384
Thr Val Thr Gln Thr Pro Ser His Ser Trp Ser Asn Gly His Thr Glu	
115 120 125	
agc atc att tcg gaa agc cac tct gtc atc gtg atg tca tcc gta gaa	432
Ser Ile Ile Ser Glu Ser His Ser Val Ile Val Met Ser Ser Val Glu	
130 135 140	
aac agt agg cac agc agc ccg act ggg ggc ccg aga gga cgt ctc aat	480
Asn Ser Arg His Ser Ser Pro Thr Gly Gly Pro Arg Gly Arg Leu Asn	
145 150 155 160	
ggc ttg gga ggc cct cgt gaa tgt aac agc ttc ctc agg cat gcc aga	528
Gly Leu Gly Gly Pro Arg Glu Cys Asn Ser Phe Leu Arg His Ala Arg	
165 170 175	
gaa acc cct gac tcc tac cga gac tct cct cat agt gaa ag	569
Glu Thr Pro Asp Ser Tyr Arg Asp Ser Pro His Ser Glu	
180 185	

<210> 37

<211> 569

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)...(569)

<400> 37

aaa gcg gag gag ctg tac cag aag aga gtg ctg acc ata acc ggc atc	48
Lys Ala Glu Glu Leu Tyr Gln Lys Arg Val Leu Thr Ile Thr Gly Ile	
1 5 10 15	
tgc atc gcc ctc ctt gtg gtc ggc atc atg tgt gtg gtg gcc tac tgc	96
Cys Ile Ala Leu Leu Val Val Gly Ile Met Cys Val Val Ala Tyr Cys	
20 25 30	
aaa acc aag aaa cag cgg aaa aag ctg cat gac cgt ctt cgg cag agc	144
Lys Thr Lys Lys Gln Arg Lys Lys Leu His Asp Arg Leu Arg Gln Ser	
35 40 45	
ctt cgg tct gaa cga aac aat atg atg aac att gcc aat ggg cct cac	192
Leu Arg Ser Glu Arg Asn Asn Met Met Asn Ile Ala Asn Gly Pro His	
50 55 60	
cat cct aac cca ccc ccc gag aat gtc cag ctg gtg aat caa tac gta	240
His Pro Asn Pro Pro Glu Asn Val Gln Leu Val Asn Gln Tyr Val	
65 70 75 80	
tct aaa aac gtc atc tcc agt gag cat att gtt gag aga gaa gca gag	288
Ser Lys Asn Val Ile Ser Ser Glu His Ile Val Glu Arg Glu Ala Glu	
85 90 95	
aca tcc ttt tcc acc agt cac tat act tcc aca gcc cat cac tcc act	336
Thr Ser Phe Ser Thr Ser His Tyr Thr Ser Thr Ala His His Ser Thr	
100 105 110	
act gtc acc cag act cct agc cac agc tgg agc aac gga cac act gaa	384
Thr Val Thr Gln Thr Pro Ser His Ser Trp Ser Asn Gly His Thr Glu	
115 120 125	
agc atc ctt tcc gaa agc cac tct gta atc gtg atg tca tcc gta gaa	432
Ser Ile Leu Ser Glu Ser His Ser Val Ile Val Met Ser Ser Val Glu	
130 135 140	
aac agt agg cac agc agc cca act ggg ggc cca aga gga cgt ctt aat	480
Asn Ser Arg His Ser Ser Pro Thr Gly Gly Pro Arg Gly Arg Leu Asn	
145 150 155 160	
ggc aca gga ggc cct cgt gaa tgt aac agc ttc ctc agg cat gcc aga	528
Gly Thr Gly Gly Pro Arg Glu Cys Asn Ser Phe Leu Arg His Ala Arg	
165 170 175	
gaa acc cct gat tcc tac cga gac tct cct cat agt gaa ag	569
Glu Thr Pro Asp Ser Tyr Arg Asp Ser Pro His Ser Glu	
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<210> 38

<211> 190

<212> PRT

<213> Homo sapiens

<400> 38

Lys Ala Glu Glu Leu Tyr Gln Lys Arg Val Leu Thr Ile Thr Gly Ile





35

40

45

<210> 41  
 <211> 217  
 <212> PRT  
 <213> Bos taurus

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 35 40 45  
 Val Glu Glu Glu Arg Pro Leu Leu Leu Val Thr Pro Pro Arg Leu Arg  
 50 55 60  
 Glu Lys Tyr Asp His His Ala Gln Gln Phe Asn Ser Phe His Cys Asn  
 65 70 75 80  
 Pro Ala His Glu Ser Asn Ser Leu Pro Pro Ser Pro Leu Arg Ile Val  
 85 90 95  
 Glu Asp Glu Glu Tyr Glu Thr Thr Gln Glu Tyr Glu Pro Ala Gln Glu  
 100 105 110  
 Pro Val Lys Lys Leu Thr Asn Ser Ser Arg Arg Ala Lys Arg Thr Lys  
 115 120 125  
 Pro Asn Gly His Ile Ala His Arg Leu Glu Met Asp Asn Asn Thr Gly  
 130 135 140  
 Ala Asp Ser Ser Asn Ser Glu Ser Glu Thr Glu Asp Glu Arg Val Gly  
 145 150 155 160  
 Glu Asp Thr Pro Phe Leu Ala Ile Gln Asn Pro Leu Ala Ala Ser Leu  
 165 170 175  
 Glu Ala Ala Pro Ala Phe Arg Leu Val Asp Ser Arg Thr Asn Pro Thr  
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 Gly Gly Phe Ser Pro Gln Glu Glu Leu Gln Ala Arg Leu Ser Gly Val  
 195 200 205  
 Ile Ala Asn Gln Asp Pro Ile Ala Val  
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<210> 42  
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 <212> DNA  
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<220>  
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 Tyr Val Ser Ala Met Thr Thr Pro Ala Arg Met Ser Pro Val Asp Phe  
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 cac acg cca agc tcc ccc aag tca ccc cct tcg gaa atg tcc ccg ccc 97  
 His Thr Pro Ser Ser Pro Lys Ser Pro Pro Ser Glu Met Ser Pro Pro  
 20 25 30  
 gtg tcc agc acg acg gtc tcc atg ccc tcc atg gcg gtc agt ccc ttc 145

Val	Ser	Ser	Thr	Thr	Val	Ser	Met	Pro	Ser	Met	Ala	Val	Ser	Pro	Phe	
		35					40					45				
gtg	gaa	gag	gag	aga	ccc	ctg	ctc	ctt	gtg	acg	cca	cca	cgg	ctg	cgg	193
Val	Glu	Glu	Glu	Arg	Pro	Leu	Leu	Leu	Val	Thr	Pro	Pro	Arg	Leu	Arg	
	50					55				60						
gag	aag	tat	gac	cac	cac	gcc	cag	caa	ttc	aac	tcg	ttc	cac	tgc	aac	241
Glu	Lys	Tyr	Asp	His	His	Ala	Gln	Gln	Phe	Asn	Ser	Phe	His	Cys	Asn	
	65				70				75					80		
ccc	gcg	cat	gag	agc	aac	agc	ctg	ccc	ccc	agc	ccc	ttg	agg	ata	gtg	289
Pro	Ala	His	Glu	Ser	Asn	Ser	Leu	Pro	Pro	Ser	Pro	Leu	Arg	Ile	Val	
			85				90						95			
gag	gat	gag	gaa	tat	gaa	acg	acc	cag	gag	tac	gaa	cca	gct	caa	gag	337
Glu	Asp	Glu	Glu	Tyr	Glu	Thr	Thr	Gln	Glu	Tyr	Glu	Pro	Ala	Gln	Glu	
		100						105					110			
ccg	gtt	aag	aaa	ctc	acc	aac	agc	agc	cgg	cgg	gcc	aaa	aga	acc	aag	385
Pro	Val	Lys	Lys	Leu	Thr	Asn	Ser	Ser	Arg	Arg	Ala	Lys	Arg	Thr	Lys	
	115					120					125					
ccc	aat	ggt	cac	att	gcc	cac	agg	ttg	gaa	atg	gac	aac	aac	aca	ggc	433
Pro	Asn	Gly	His	Ile	Ala	His	Arg	Leu	Glu	Met	Asp	Asn	Asn	Thr	Gly	
	130				135						140					
gct	gac	agc	agt	aac	tca	gag	agc	gaa	aca	gag	gat	gaa	aga	gta	gga	481
Ala	Asp	Ser	Ser	Asn	Ser	Glu	Ser	Glu	Thr	Glu	Asp	Glu	Arg	Val	Gly	
	145				150					155				160		
gaa	gat	acg	cct	ttc	ctg	gcc	ata	cag	aac	ccc	ctg	gca	gcc	agt	ctc	529
Glu	Asp	Thr	Pro	Phe	Leu	Ala	Ile	Gln	Asn	Pro	Leu	Ala	Ala	Ser	Leu	
			165					170					175			
gag	gcg	gcc	cct	gcc	ttc	cgc	ctg	gtc	gac	agc	agg	act	aac	cca	aca	577
Glu	Ala	Ala	Pro	Ala	Phe	Arg	Leu	Val	Asp	Ser	Arg	Thr	Asn	Pro	Thr	
		180						185					190			
ggc	ggc	ttc	tct	ccg	cag	gaa	gaa	ttg	cag	gcc	agg	ctc	tcc	ggg	gta	625
Gly	Gly	Phe	Ser	Pro	Gln	Glu	Glu	Leu	Gln	Ala	Arg	Leu	Ser	Gly	Val	
		195				200						205				
atc	gct	aac	caa	gac	cct	atc	gct	gtc	taaaaccgaa	atacaccat						672
Ile	Ala	Asn	Gln	Asp	Pro	Ile	Ala	Val								
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gccttccatg	gcggtcagcc	ccttcacatgga	agaagagaga	cctctacttc	tcgtgacacc	180										
accaaggctg	cgggagaaga	agtttgacca	tcaccctcag	cagttcagct	ccttcacca	240										

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caacccccg cg catgacagta acagcctccc tgctagcccc ttgaggatag tggaggatga 300
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tagccggcg gccaagaagaa ccaagcccaa tggccacatt gctaacagat tggaggtgga 420
cagcaacaca agctcccaga gcagtaactc agagagtga acagaagatg aaagagtagg 480
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tgcttccgc ctggctgaca gcaggactaa cccagcaggc cgcttctcga cacaggaaga 600
aatccaggcc aggtgtgcta gtgtaattgc taaccaagac cctattgctg tataaaacct 660
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<210> 44  
 <211> 217  
 <212> PRT  
 <213> Homo sapiens

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His Thr Pro Ser Ser Pro Lys Ser Pro Ser Glu Met Ser Pro Pro
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Asn Glu Glu Glu Arg Pro Leu Leu Leu Val Thr Pro Pro Arg Leu Arg
          50          55          60
Glu Lys Lys Phe Asp His His Pro Gln Gln Phe Ser Ser Phe His His
65          70          75          80
Asn Pro Ala His Asp Ser Asn Ser Leu Pro Ala Ser Pro Leu Arg Ile
          85          90          95
Val Glu Asp Glu Glu Tyr Glu Thr Thr Gln Glu Tyr Glu Pro Ala Gln
          100          105          110
Glu Pro Val Lys Lys Leu Ala Asn Ser Arg Arg Ala Lys Arg Thr Lys
          115          120          125
Pro Asn Gly His Ile Ala Asn Arg Leu Glu Val Asp Ser Asn Thr Ser
          130          135          140
Ser Gln Ser Ser Asn Ser Glu Ser Glu Thr Glu Asp Glu Arg Val Gly
145          150          155          160
Glu Asp Thr Pro Phe Leu Gly Ile Gln Asn Pro Leu Ala Ala Ser Leu
          165          170          175
Glu Ala Thr Pro Ala Phe Arg Leu Ala Asp Ser Arg Thr Asn Pro Ala
          180          185          190
Gly Arg Phe Ser Thr Gln Glu Glu Ile Gln Ala Arg Leu Ser Ser Val
          195          200          205
Ile Ala Asn Gln Asp Pro Ile Ala Val
          210          215

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<210> 45  
 <211> 34  
 <212> PRT  
 <213> Bos taurus

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<400> 45
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Pro Ala

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<210> 46  
 <211> 559  
 <212> DNA  
 <213> Bos taurus

<220>  
 <221> CDS  
 <222> (460)...(559)

<221> misc\_feature  
 <222> 214  
 <223> n = A,T,C or G

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 tgcgagcgcg ccggaccgag gcagcgacag gagcggaccg cggcgggaac cgaggactcc 180  
 ccagcggcgc gccagcagga gccacccgcg gagnctgctg accgggacgg agcggccgcc 240  
 agtcccaggt ggcccggacc gcacgttgct tccccgcgct ccccgccggc gacaggagac 300  
 gctccccccc acgcccgcgc gcctcggcc cggtcgtctg ccgcctcca ctccggggac 360  
 aaacttttcc cgaagccgat cccagccctc ggacccaaac ttgtcgcgcg tcgccttcgc 420  
 cgggagccgt ccgcgcagag cgtgcacttc tcgggcgag atg tcg gag cgc aga 474  
 Met Ser Glu Arg Arg  
 1 5

gaa ggc aaa ggc aag ggg aag ggc ggc aag aag gac cga ggc tcc ggg 522  
 Glu Gly Lys Gly Lys Gly Lys Gly Lys Lys Asp Arg Gly Ser Gly  
 10 15 20

aag aag ccc gtg ccc gcg gct ggc ggc ccg agc cca g 559  
 Lys Lys Pro Val Pro Ala Ala Gly Gly Pro Ser Pro  
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<210> 47  
 <211> 231  
 <212> DNA  
 <213> Homo sapiens

<220>  
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 <222> (132)...(231)

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 cgatccgagc ccttgacca aactcgctg cgccgagagc cgtccgcgta gagcgctccg 120  
 tctccggcga g atg tcc gag cgc aaa gaa ggc aga ggc aaa ggg aag ggc 170  
 Met Ser Glu Arg Lys Glu Gly Arg Gly Lys Gly Lys Gly  
 1 5 10

aag aag aag gag cga ggc tcc ggc aag aag ccg gag tcc gcg gcg ggc 218  
 Lys Lys Lys Glu Arg Gly Ser Gly Lys Lys Pro Glu Ser Ala Ala Gly  
 15 20 25

agc cag agc cca g 231  
 Ser Gln Ser Pro  
 30

<210> 48  
 <211> 34  
 <212> PRT  
 <213> Homo sapiens

<400> 48  
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 1 5 10 15  
 Glu Arg Gly Ser Gly Lys Lys Pro Glu Ser Ala Ala Gly Ser Gln Ser  
 20 25 30  
 Pro Ala  
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<210> 49  
 <211> 1764  
 <212> DNA  
 <213> Bos taurus

<220>  
 <221> CDS  
 <222> (2)...(1681)

<400> 49  
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 tat atg tgc aaa gtg atc agc aaa cta gga aat gac agt gcc tct gcc 97  
 Tyr Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala  
 20 25 30  
 aac atc acc att gtg gag tca aac gcc aca tcc aca tct aca gct ggg 145  
 Asn Ile Thr Ile Val Glu Ser Asn Ala Thr Ser Thr Ser Thr Ala Gly  
 35 40 45  
 aca agc cat ctt gtc aag tgt gca gag aag gag aaa act ttc tgt gtg 193  
 Thr Ser His Leu Val Lys Cys Ala Glu Lys Glu Lys Thr Phe Cys Val  
 50 55 60  
 aat gga ggc gac tgc ttc atg gtg aaa gac ctt tca aat ccc tca aga 241  
 Asn Gly Gly Asp Cys Phe Met Val Lys Asp Leu Ser Asn Pro Ser Arg  
 65 70 75 80  
 tac ttg tgc aag tgc caa cct gga ttc act gga gcg aga tgt act gag 289  
 Tyr Leu Cys Lys Cys Gln Pro Gly Phe Thr Gly Ala Arg Cys Thr Glu  
 85 90 95  
 aat gtg ccc atg aaa gtc caa acc caa gaa aaa gcg gag gag ctc tac 337  
 Asn Val Pro Met Lys Val Gln Thr Gln Glu Lys Ala Glu Glu Leu Tyr  
 100 105 110  
 cag aag aga gtg ctc acc att acc ggc att tgc atc gcg ctg ctc gtg 385  
 Gln Lys Arg Val Leu Thr Ile Thr Gly Ile Cys Ile Ala Leu Leu Val  
 115 120 125  
 gtt ggc atc atg tgt gtg gtg gtc tac tgc aaa acc aag aaa caa cgg 433  
 Val Gly Ile Met Cys Val Val Val Tyr Cys Lys Thr Lys Lys Gln Arg  
 130 135 140

aaa aag ctt cat gac cgg ctt cgg cag agc ctt cgg tct gaa aga aac	481
Lys Lys Leu His Asp Arg Leu Arg Gln Ser Leu Arg Ser Glu Arg Asn	
145 150 155 160	
acc atg atg aac gta gcc aac ggg ccc cac cac ccc aat ccg ccc ccc	529
Thr Met Met Asn Val Ala Asn Gly Pro His His Pro Asn Pro Pro Pro	
165 170 175	
gag aac gtg cag ctg gtg aat caa tac gta tct aaa aat gtc atc tct	577
Glu Asn Val Gln Leu Val Asn Gln Tyr Val Ser Lys Asn Val Ile Ser	
180 185 190	
agc gag cat att gtt gag aga gag gcg gag agc tct ttt tcc acc agt	625
Ser Glu His Ile Val Glu Arg Glu Ala Glu Ser Ser Phe Ser Thr Ser	
195 200 205	
cac tac act tcg aca gct cat cat tcc act act gtc act cag act ccc	673
His Tyr Thr Ser Thr Ala His His Ser Thr Thr Val Thr Gln Thr Pro	
210 215 220	
agt cac agc tgg agc aat gga cac act gaa agc atc att tcg gaa agc	721
Ser His Ser Trp Ser Asn Gly His Thr Glu Ser Ile Ile Ser Glu Ser	
225 230 235 240	
cac tct gtc atc gtg atg tca tcc gta gaa aac agt agg cac agc agc	769
His Ser Val Ile Val Met Ser Ser Val Glu Asn Ser Arg His Ser Ser	
245 250 255	
ccg act ggg ggc ccg aga gga cgt ctc aat ggc ttg gga ggc cct cgt	817
Pro Thr Gly Gly Pro Arg Gly Arg Leu Asn Gly Leu Gly Gly Pro Arg	
260 265 270	
gaa tgt aac agc ttc ctc agg cat gcc aga gaa acc cct gac tcc tac	865
Glu Cys Asn Ser Phe Leu Arg His Ala Arg Glu Thr Pro Asp Ser Tyr	
275 280 285	
cga gac tct cct cat agt gaa aga cat aac ctt ata gct gag cta agg	913
Arg Asp Ser Pro His Ser Glu Arg His Asn Leu Ile Ala Glu Leu Arg	
290 295 300	
aga aac aag gcc cac aga tcc aaa tgc atg cag atc cag ctt tcc gca	961
Arg Asn Lys Ala His Arg Ser Lys Cys Met Gln Ile Gln Leu Ser Ala	
305 310 315 320	
act cat ctt aga gct tct tcc att ccc cat tgg gct tca ttc tct aag	1009
Thr His Leu Arg Ala Ser Ser Ile Pro His Trp Ala Ser Phe Ser Lys	
325 330 335	
acc cct tgg cct tta gga agg tat gta tca gca atg acc acc ccg gct	1057
Thr Pro Trp Pro Leu Gly Arg Tyr Val Ser Ala Met Thr Thr Pro Ala	
340 345 350	
cgt atg tca cct gta gat ttc cac acg cca agc tcc ccc aag tca ccc	1105
Arg Met Ser Ser Val Asp Phe His Thr Pro Ser Ser Pro Lys Ser Pro	
355 360 365	
cct tcg gaa atg tcc ccg ccc gtg tcc agc acg acg gtc tcc atg ccc	1153
Pro Ser Glu Met Ser Pro Pro Val Ser Ser Thr Thr Val Ser Met Pro	

370	375	380	
tcc atg gcg gtc agt	ccc ttc gtg gaa gag	gag aga ccc ctg ctc ctt	1201
Ser Met Ala Val Ser	Pro Phe Val Glu Glu	Glu Arg Pro Leu Leu Leu	
385	390	395 400	
gtg acg cca cca cgg	ctg cgg gag aag tat	gac cac cac gcc cag caa	1249
Val Thr Pro Pro Arg	Leu Arg Glu Lys Tyr	Asp His His Ala Gln Gln	
	405	410 415	
ttc aac tcg ttc cac	tgc aac ccc gcg cat	gag agc aac agc ctg ccc	1297
Phe Asn Ser Phe His	Cys Asn Pro Ala His	Glu Ser Asn Ser Leu Pro	
	420	425 430	
ccc agc ccc ttg agg	ata gtg gag gat gag	gaa tat gaa acg acc cag	1345
Pro Ser Pro Leu Arg	Ile Val Glu Asp Glu	Glu Tyr Glu Thr Thr Gln	
	435	440 445	
gag tac gaa cca gct	caa gag ccg gtt aag	aaa ctc acc aac agc agc	1393
Glu Tyr Glu Pro Ala	Gln Glu Pro Val Lys	Lys Leu Thr Asn Ser Ser	
	450	455 460	
cgg cgg gcc aaa aga	acc aag ccc aat ggt	cac att gcc cac agg ttg	1441
Arg Arg Ala Lys Arg	Thr Lys Pro Asn Gly	His Ile Ala His Arg Leu	
	465	470 475 480	
gaa atg gac aac aac	aca ggc gct gac agc	agt aac tca gag agc gaa	1489
Glu Met Asp Asn Asn	Thr Gly Ala Asp Ser	Ser Ser Asn Ser Glu Ser Glu	
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aca gag gat gaa aga	gta gga gaa gat acg	cct ttc ctg gcc ata cag	1537
Thr Glu Asp Glu Arg	Val Gly Glu Asp Thr	Pro Phe Leu Ala Ile Gln	
	500	505 510	
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Asn Pro Leu Ala Ala	Ser Leu Glu Ala Ala	Pro Ala Phe Arg Leu Val	
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gac agc agg act aac	cca aca ggc ggc ttc	tct ccg cag gaa gaa ttg	1633
Asp Ser Arg Thr Asn	Pro Thr Gly Gly Phe	Ser Pro Gln Glu Glu Leu	
	530	535 540	
cag gcc agg ctc tcc	ggt gta atc gct aac	caa gac cct atc gct gtc	1681
Gln Ala Arg Leu Ser	Gly Val Ile Ala Asn	Gln Asp Pro Ile Ala Val	
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Tyr	Leu	Cys	Lys	Cys	Gln	Pro	Gly	Phe	Thr	Gly	Ala	Arg	Cys	Thr	Glu
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Gln	Lys	Arg	Val	Leu	Thr	Ile	Thr	Gly	Ile	Cys	Ile	Ala	Leu	Leu	Val
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Thr	Met	Met	Asn	Val	Ala	Asn	Gly	Pro	His	His	Pro	Asn	Pro	Pro	Pro
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Glu	Asn	Val	Gln	Leu	Val	Asn	Gln	Tyr	Val	Ser	Lys	Asn	Val	Ile	Ser
			180					185					190		
Ser	Glu	His	Ile	Val	Glu	Arg	Glu	Ala	Glu	Ser	Ser	Phe	Ser	Thr	Ser
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His	Tyr	Thr	Ser	Thr	Ala	His	His	Ser	Thr	Thr	Val	Thr	Gln	Thr	Pro
	210					215					220				
Ser	His	Ser	Trp	Ser	Asn	Gly	His	Thr	Glu	Ser	Ile	Ile	Ser	Glu	Ser
225					230					235					240
His	Ser	Val	Ile	Val	Met	Ser	Ser	Val	Glu	Asn	Ser	Arg	His	Ser	Ser
				245					250					255	
Pro	Thr	Gly	Gly	Pro	Arg	Gly	Arg	Leu	Asn	Gly	Leu	Gly	Gly	Pro	Arg
			260				265						270		
Glu	Cys	Asn	Ser	Phe	Leu	Arg	His	Ala	Arg	Glu	Thr	Pro	Asp	Ser	Tyr
		275					280					285			
Arg	Asp	Ser	Pro	His	Ser	Glu	Arg	His	Asn	Leu	Ile	Ala	Glu	Leu	Arg
290						295					300				
Arg	Asn	Lys	Ala	His	Arg	Ser	Lys	Cys	Met	Gln	Ile	Gln	Leu	Ser	Ala
305					310					315					320
Thr	His	Leu	Arg	Ala	Ser	Ser	Ile	Pro	His	Trp	Ala	Ser	Phe	Ser	Lys
				325					330					335	
Thr	Pro	Trp	Pro	Leu	Gly	Arg	Tyr	Val	Ser	Ala	Met	Thr	Thr	Pro	Ala
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Arg	Met	Ser	Pro	Val	Asp	Phe	His	Thr	Pro	Ser	Ser	Pro	Lys	Ser	Pro
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Pro	Ser	Glu	Met	Ser	Pro	Pro	Val	Ser	Ser	Thr	Thr	Val	Ser	Met	Pro
	370					375					380				
Ser	Met	Ala	Val	Ser	Pro	Phe	Val	Glu	Glu	Glu	Arg	Pro	Leu	Leu	Leu
385					390					395					400
Val	Thr	Pro	Pro	Arg	Leu	Arg	Glu	Lys	Tyr	Asp	His	His	Ala	Gln	Gln
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Phe	Asn	Ser	Phe	His	Cys	Asn	Pro	Ala	His	Glu	Ser	Asn	Ser	Leu	Pro
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Pro	Ser	Pro	Leu	Arg	Ile	Val	Glu	Asp	Glu	Glu	Tyr	Glu	Thr	Thr	Gln
		435					440					445			
Glu	Tyr	Glu	Pro	Ala	Gln	Glu	Pro	Val	Lys	Lys	Leu	Thr	Asn	Ser	Ser
	450					455					460				
Arg	Arg	Ala	Lys	Arg	Thr	Lys	Pro	Asn	Gly	His	Ile	Ala	His	Arg	Leu
465					470					475					480
Glu	Met	Asp	Asn	Asn	Thr	Gly	Ala	Asp	Ser	Ser	Asn	Ser	Glu	Ser	Glu
				485					490					495	
Thr	Glu	Asp	Glu	Arg	Val	Gly	Glu	Asp	Thr	Pro	Phe	Leu	Ala	Ile	Gln



	500		505		510										
Asn	Pro	Leu	Ala	Ala	Ser	Leu	Glu	Ala	Ala	Pro	Ala	Phe	Arg	Leu	Val
	515		520		525										
Asp	Ser	Arg	Thr	Asn	Pro	Thr	Gly	Gly	Phe	Ser	Pro	Gln	Glu	Glu	Leu
	530		535		540										
Gln	Ala	Arg	Leu	Ser	Gly	Val	Ile	Ala	Asn	Gln	Asp	Pro	Ile	Ala	Val
545			550		555										560

<210> 51  
 <211> 1140  
 <212> DNA  
 <213> Bos taurus

<220>  
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<221> misc\_feature  
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His Gln Val Trp Ala Ala Lys Ala Gly Gly Leu Lys Lys Asp Ser Leu	
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ctc acc gtg cgc ctg ggc gcc tgg ggc cac ccc gcc ttc ccc tcc tgc	96
Leu Thr Val Arg Leu Gly Ala Trp Gly His Pro Ala Phe Pro Ser Cys	
20 25 30	
ggg cgc ctc aag gag gac agc agg tac atc ttc ttc atg gag ccc gag	144
Gly Arg Leu Lys Glu Asp Ser Arg Tyr Ile Phe Phe Met Glu Pro Glu	
35 40 45	
gcc aac agc agc ggc ggg ccc ggc cgc ctt ccg agc ctc ctt ccc ccc	192
Ala Asn Ser Ser Gly Gly Pro Gly Arg Leu Pro Ser Leu Leu Pro Pro	
50 55 60	
tct cga gac ggg ccg gaa cct caa gaa gga ggt cag ccg ggt gct gtg	240
Ser Arg Asp Gly Pro Glu Pro Gln Glu Gly Gly Gln Pro Gly Ala Val	
65 70 75 80	
caa cgg tgc gcc ttg cct ccc cgc ttg aaa gag atg aag agt cag gag	288
Gln Arg Cys Ala Leu Pro Pro Arg Leu Lys Glu Met Lys Ser Gln Glu	
85 90 95	
tct gtg gca ggt tcc aaa cta gtg ctt cgg tgc gag acc agt tct gaa	336
Ser Val Ala Gly Ser Lys Leu Val Leu Arg Cys Glu Thr Ser Ser Glu	
100 105 110	
tac tcc tct ctc aag ttc aag tgg ttc aag aat ggg agt gaa tta agc	384
Tyr Ser Ser Leu Lys Phe Lys Trp Phe Lys Asn Gly Ser Glu Leu Ser	
115 120 125	
cga aag aac aaa cca gaa aac atc aag ata cag aaa agg ccg ggg aag	432
Arg Lys Asn Lys Pro Glu Asn Ile Lys Ile Gln Lys Arg Pro Gly Lys	
130 135 140	

tca gaa ctt cgc att agc aaa gcg tca ctg gct gat tct gga gaa tat 480  
 Ser Glu Leu Arg Ile Ser Lys Ala Ser Leu Ala Asp Ser Gly Glu Tyr  
 145 150 155 160  
 atg tgc aaa gtg atc agc aaa cta gga aat gac agt gcc tct gcc aac 528  
 Met Cys Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala Asn  
 165 170 175  
 atc acc att gtg gag tca aac gcc aca tcc aca tct aca gct ggg aca 576  
 Ile Thr Ile Val Glu Ser Asn Ala Thr Ser Thr Ser Thr Ala Gly Thr  
 180 185 190  
 agc cat ctt gtc aag tgt gca gag aag gag aaa act ttc tgt gtg aat 624  
 Ser His Leu Val Lys Cys Ala Glu Lys Glu Lys Thr Phe Cys Val Asn  
 195 200 205  
 gga ggc gag tgc ttc atg gtg aaa gac ctt tca aat ccc tca aga tac 672  
 Gly Gly Glu Cys Phe Met Val Lys Asp Leu Ser Asn Pro Ser Arg Tyr  
 210 215 220  
 ttg tgc aag tgc caa cct gga ttc act gga gcg aga tgt act gag aat 720  
 Leu Cys Lys Cys Gln Pro Gly Phe Thr Gly Ala Arg Cys Thr Glu Asn  
 225 230 235 240  
 gtg ccc atg aaa gtc caa acc caa gaa aag tgc cca aat gag ttt act 768  
 Val Pro Met Lys Val Gln Thr Gln Glu Lys Cys Pro Asn Glu Phe Thr  
 245 250 255  
 ggt gat cgc tgc caa aac tac gta atg gcc agc ttc tac agt acg tcc 816  
 Gly Asp Arg Cys Gln Asn Tyr Val Met Ala Ser Phe Tyr Ser Thr Ser  
 260 265 270  
 act ccc ttt ctg tct ctg cct gaa tagcgcatct cagtcgggtgc cgctttcttg 870  
 Thr Pro Phe Leu Ser Leu Pro Glu  
 275 280  
 ttgccgcattc tcccctcaga ttcncctag agctagatgc gttttaccag gtctaacatt 930  
 gactgcctct gcctgtcgca tgagaacatt aacacaagcg attgtatgac ttcctctgtc 990  
 cgtgactagt gggctctgag ctactcgtag gtgcgtaagg ctccagtgtt tctgaaattg 1050  
 atcttgaatt actgtgatac gacatgatag tccctctcac ccagtgcgaat gacaataaag 1110  
 gccttgaaaa gtcaaaaaaa aaaaaaaaaa 1140

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 <211> 280  
 <212> PRT  
 <213> Bos taurus

<400> 52  
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 1 5 10 15  
 Leu Thr Val Arg Leu Gly Ala Trp Gly His Pro Ala Phe Pro Ser Cys  
 20 25 30  
 Gly Arg Leu Lys Glu Asp Ser Arg Tyr Ile Phe Phe Met Glu Pro Glu  
 35 40 45  
 Ala Asn Ser Ser Gly Gly Pro Gly Arg Leu Pro Ser Leu Leu Pro Pro  
 50 55 60  
 Ser Arg Asp Gly Pro Glu Pro Gln Glu Gly Gly Gln Pro Gly Ala Val  
 65 70 75 80  
 Gln Arg Cys Ala Leu Pro Pro Arg Leu Lys Glu Met Lys Ser Gln Glu



ctt cgg tgc gag acc agt tct gaa tac tcc tct ctc aag ttc aag tgg 668  
 Leu Arg Cys Glu Thr Ser Ser Glu Tyr Ser Ser Leu Lys Phe Lys Trp  
 55 60 65 70  
 ttc aag aat ggg agt gaa tta agc cga aag aac aaa cca caa aac atc 716  
 Phe Lys Asn Gly Ser Glu Leu Ser Arg Lys Asn Lys Pro Gln Asn Ile  
 75 80 85  
 aag ata cag aaa agg ccg ggg aag tca gaa ctt cgc att agc aaa gcg 764  
 Lys Ile Gln Lys Arg Pro Gly Lys Ser Glu Leu Arg Ile Ser Lys Ala  
 90 95 100  
 tca ctg gct gat tct gga gaa tat atg tgc aaa gtg atc agc aaa cta 812  
 Ser Leu Ala Asp Ser Gly Glu Tyr Met Cys Lys Val Ile Ser Lys Leu  
 105 110 115  
 gga aat gac agt gcc tct gcc aac atc acc att gtg gag tca aac gag 860  
 Gly Asn Asp Ser Ala Ser Ala Asn Ile Thr Ile Val Glu Ser Asn Glu  
 120 125 130  
 atc acc act ggc atg cca gcc tca act gag aca gcg tat gtg tct tca 908  
 Ile Thr Thr Gly Met Pro Ala Ser Thr Glu Thr Ala Tyr Val Ser Ser  
 135 140 145 150  
 gag tct ccc att aga ata tca gta tca aca gaa gga aca aat act tct 956  
 Glu Ser Pro Ile Arg Ile Ser Val Ser Thr Glu Gly Thr Asn Thr Ser  
 155 160 165  
 tca tcc aca tcc aca tct aca gct ggg aca agc cat ctt gtc aag tgt 1004  
 Ser Ser Thr Ser Thr Ser Thr Ala Gly Thr Ser His Leu Val Lys Cys  
 170 175 180  
 gca gag aag gag aaa act ttc tgt gtg aat gga ggc gag tgc ttc atg 1052  
 Ala Glu Lys Glu Lys Thr Phe Cys Val Asn Gly Gly Glu Cys Phe Met  
 185 190 195  
 gtg aaa gac ctt tca aat ccc tca aga tac ttg tgc aag tgc cca aat 1100  
 Val Lys Asp Leu Ser Asn Pro Ser Arg Tyr Leu Cys Lys Cys Pro Asn  
 200 205 210  
 gag ttt act ggt gat cgc tgc caa aac tac gta atg gcc agc ttc tac 1148  
 Glu Phe Thr Gly Asp Arg Cys Gln Asn Tyr Val Met Ala Ser Phe Tyr  
 215 220 225 230  
 agt acg tcc act ccc ttt ctg tct ctg cct gaa taggcgcacg ctcagtcggt 1201  
 Ser Thr Ser Thr Pro Phe Leu Ser Leu Pro Glu  
 235 240  
 gccgctttct tgttgccgca tctccctca gattcaacct agagctagat gcgttttacc 1261  
 aggtctaaca ttgactgcct ctgcctgtcg catgagaaca ttaacacaag cgattgtatg 1321  
 acttcctctg tccgtgacta gtgggctctg agctactcgt aggtgcgtaa ggctccagtg 1381  
 tttctgaaat tgatcttgaa ttactgtgat acgacatgat agtccctctc acccagtgca 1441  
 atgacaataa aggccttgaa aagtctcact tttattgaga aaataaaaaat cgttccacgg 1501  
 gacagtcct cttctttata aaatgacct atccttgaaa aggaggtgtg ttaagttgta 1561  
 accagtacac acttgaaatg atggtaagtt cgcttcggtt cagaatgtgt tctttctgac 1621  
 aaataaacag aataaaaaaa aaaaaaaaaa a 1652

<210> 54

<211> 241  
 <212> PRT  
 <213> Bos taurus

<400> 54  
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 1 5 10 15  
 Asp Arg Gly Ser Gly Lys Lys Pro Val Pro Ala Ala Gly Gly Pro Ser  
 20 25 30  
 Pro Ala Leu Pro Pro Arg Leu Lys Glu Met Lys Ser Gln Glu Ser Val  
 35 40 45  
 Ala Gly Ser Lys Leu Val Leu Arg Cys Glu Thr Ser Ser Glu Tyr Ser  
 50 55 60  
 Ser Leu Lys Phe Lys Trp Phe Lys Asn Gly Ser Glu Leu Ser Arg Lys  
 65 70 75 80  
 Asn Lys Pro Gln Asn Ile Lys Ile Gln Lys Arg Pro Gly Lys Ser Glu  
 85 90 95  
 Leu Arg Ile Ser Lys Ala Ser Leu Ala Asp Ser Gly Glu Tyr Met Cys  
 100 105 110  
 Lys Val Ile Ser Lys Leu Gly Asn Asp Ser Ala Ser Ala Asn Ile Thr  
 115 120 125  
 Ile Val Glu Ser Asn Glu Ile Thr Thr Gly Met Pro Ala Ser Thr Glu  
 130 135 140  
 Thr Ala Tyr Val Ser Ser Glu Ser Pro Ile Arg Ile Ser Val Ser Thr  
 145 150 155 160  
 Glu Gly Thr Asn Thr Ser Ser Ser Thr Ser Thr Ser Thr Ala Gly Thr  
 165 170 175  
 Ser His Leu Val Lys Cys Ala Glu Lys Glu Lys Thr Phe Cys Val Asn  
 180 185 190  
 Gly Gly Glu Cys Phe Met Val Lys Asp Leu Ser Asn Pro Ser Arg Tyr  
 195 200 205  
 Leu Cys Lys Cys Pro Asn Glu Phe Thr Gly Asp Arg Cys Gln Asn Tyr  
 210 215 220  
 Val Met Ala Ser Phe Tyr Ser Thr Ser Thr Pro Phe Leu Ser Leu Pro  
 225 230 235 240  
 Glu